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Following Epidural PCA Use, Do Obstetric Patients Feel Satisfied With Their Pain Control

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FOLLOWING EPIDURAL PCA USE, DO OBSTETRIC PATIENTS FEEL SATISFIED WITH THEIR PAIN CONTROL

by

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ABSTRACT

Pain is a source of anxiety for many patients, and uncontrolled pain can have deleterious effects on patient outcomes (Patak et al., 2014). Pain associated with labor is a particular concern of obstetric patients. Epidural analgesia is currently the frontline treatment for pain associated with labor, with epidural patient-controlled analgesia (PCA) often being utilized (Braveman, Scavone, Blessing, & Wong, 2013). Little evidence exists that details what factors of epidural PCA that patients considered important (Patak et al., 2014). In this project, a randomized questionnaire was administered to obstetric patients to assess satisfaction levels with their epidural PCA. The questionnaire also asked patients if they felt a lighted demand button would make their PCA pump easier to use. Fourteen questionnaires were completed and analyzed. A 1 to 10 numerical scale was utilized in the survey. Patients reported a mean satisfaction score of 9.2 concerning each patient's ability to control their pain. Ninety-three percent of patients felt they were able to adequately control their pain. A mean response of 8.6 was reported for overall satisfaction with the epidural PCA pump. Patients reported a mean response of 9.6 concerning the pumps' ease of use. Seventy-nine and a half percent of patients stated they were aware when a dose was available. Of the respondents, 35.7% felt that a light would have made their PCA pump easier to use. Overall, respondents were satisfied with their pain control experience. Future studies may benefit by investigating the impact of PCA feedback features on the pain control experience of obstetric patients.

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LIST OF ABBREVIATIONS

CMS	Centers for Medicare and Medicaid Services
CRNA	Certified Registered Nurse Anesthetist
DNP	Doctor of Nursing Practice
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
IRB	Institutional Review Board
PCA	Patient Controlled Analgesia
RN	Registered Nurse
USM	The University of Southern Mississippi
VBP	Value-Based Purchasing

CHAPTER I - INTRODUCTION

Adequate pain control is a quintessential aspect of today's healthcare industry. Fear of pain can be a source of fear and anxiety for many people. Inadequate pain control can increase hospital stays, increase healthcare costs, increase readmission rates, and decrease patient satisfaction (Patak et al., 2014). Ineffective pain control strategies can also have deleterious financial effects on hospital reimbursement. Patient satisfaction with pain control is an integral component of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), which is a tool utilized by the Centers for Medicare and Medicaid Services (CMS) to measure and analyze patient experiences with care (Elliot et al., 2016). Pharmacological therapy is the traditional front-line treatment to manage pain. Many different methods can be used to control pain, with patient-controlled analgesia (PCA) being one such method. The type that will be addressed in this discussion is epidural PCA.

Adequate pain control for patients undergoing the labor process is quintessential to the proper anesthetic management of the obstetric patient population. Patient education, emotional support, hot and cold therapy, acupuncture, and patient coaching are all techniques used to reduce pain in patients undergoing labor (Braveman et al., 2013). Epidural analgesia is currently the primary method of choice to control pain associated with labor (Braveman et al., 2013). Epidural analgesia may be utilized via a continuous infusion, intermittent injections, or through epidural PCA (Braveman et al., 2013).

Proper labor analgesia includes multiple physiological benefits in addition to the relief of pain and anxiety (Braveman et al., 2013). Uncontrolled maternal pain can lead to hypertension, which in turn may reduce uterine blood flow (Braveman et al., 2013).

Epidural anesthesia has been shown to antagonize pain-associated increases in maternal heart rate, blood pressure, cardiac output, and hyperventilation (Braveman et al., 2013). Maternal hyperventilation leads to a leftward shift of the oxygen-hemoglobin dissociation curve, which in turn results in reduced fetal oxygenation (Braveman et al., 2013). The potential for these deleterious effects reinforces the importance of adequate pain control in the labor process.

Problem Description

Multiple factors have an effect on the efficacy of traditional epidural analgesia. Such factors can include the catheter insertion site, the choice of pharmaceutical agents, medication dosage, the rate of infusion, the duration of analgesia, and the accuracy of pain assessments (Macres, Moore, & Fishman, 2013). When considering the efficacy of epidural PCA, additional factors affecting analgesia efficacy and patient satisfaction must be considered. Among these factors are feedback features of the PCA pump (Patak et al., 2014). Feedback features can include but are not limited to, vibrating demand buttons and lighted demand buttons. If present, feedback features can alert the patient to the current status of the PCA pump, such as a lockout period or the pump's readiness to deliver a demand dose (Patak et al., 2014). Feedback features can also notify a patient when a dose is successfully delivered or when a dose is unable to be delivered (Patak et al., 2014).

While some PCA pumps may possess limited feedback mechanisms, the majority of PCA pumps currently in use do not offer substantial patient feedback (Patak et al., 2014). As such, it is possible that many patients' pain control experiences are not being fully optimized. Without an epidural PCA feedback system, patients may not be aware

when a dose is successfully delivered and may have difficulty locating their PCA demand button to request a dose (Patak et al., 2014). As such, the identification of factors that affect patient satisfaction with epidural PCA pumps are imperative to ensure an optimal pain control experience for patients utilizing this method of analgesia.

Theoretical Framework

The theoretical framework on which this Doctorate of Nursing Practice (DNP) project was centered is Dorothea Orem's Self-Care Deficit Theory of Nursing (Foster & Bennett, 2002). The theory of self-care is interrelated with Orem's general theory of nursing and has several critical components (Foster & Bennett, 2002). Self-care agency, a critical aspect of the theory of self-care, is defined as a person's ability or power to care for themselves (Foster & Bennett, 2002). Self-care agency is critical to a person's sense of well-being and can be influenced by age, gender, health status, socioeconomic status, developmental level, and various other conditional factors (Foster & Bennett, 2002).

The concept of self-care requisites is included in Orem's theory of self-care and is defined as the reason that self-care is performed (Foster & Bennett, 2002). Self-care requisites, also known as self-care requirements, are categorized as either universal, developmental, or health deviations (Foster & Bennett, 2002). Hospital inpatients that have utilized epidural PCA would be considered to have a health deviation. Dorothea Orem states that nursing is required when a patient's requisite demands outweigh the patient's ability to meet those demands (Foster & Bennett, 2002). Patient-controlled analgesia allows patients to meet the demand of controlling their pain without having to request a dose from their nurse. As such, this increases the patient's ability to meet their requisite demand for pain control.

Available Knowledge

An online literature review utilizing online databases was conducted by the author. The Cochrane Library, CINAHL, PubMed, and Google Scholar were the online databases utilized. Keywords used in the search included “obstetric”, “patient”, “satisfaction”, “epidural”, “PCA”, “factors”, “affecting”, “feedback”, and “features.”

Currently there is little evidence in the literature detailing which PCA pump features are most important to improve patient satisfaction with pain control (Patak et al., 2014). While there is a plethora of information regarding patient-controlled analgesia and patient satisfaction, much of this involves studies comparing PCA to different methods of analgesia. Also, a large amount of the literature regarding PCA pumps was reported in the 1990s and is not current literature.

One prospective study conducted at the University of Michigan administered questionnaires to patients in an attempt to identify factors that patients perceive as having an impact on their satisfaction with their PCA pumps (Patak et al., 2014). In this particular study, the administered survey allowed patients to rate on a scale from 1 to 10 how important certain PCA features were to them (Patak et al., 2014). Open-ended questions were also included in the survey. These open-ended questions allowed patients to express factors not directly mentioned in the survey that had an effect on their pain control satisfaction (Patak et al., 2014). The most commonly reported difficulties for patients utilizing a PCA pump were as follows: 16% of patients experienced difficulty locating their demand button, 14% of patients did not know if they received medicine after pressing their demand button, and 11% of patients reported watching the clock to know when a dose would next be available (Patak et al., 2014). The most commonly

proposed solutions by patients was a button that lights up when a dose is available, a button that stays continuously lit for easy location, a button that vibrates when a dose is available, and a PCA pump cable with a light for easier location (Patak et al., 2014). This prospective study surveyed 350 or 512 possible patients (Patak et al., 2014).

Ob*stetric Patient Population*

A large number of women become pregnant and will require health care every year. In 2016 alone, 3,945,875 births were registered in the United States (Martin, Hamilton, Osterman, Driscoll, & Drake, 2018). The State of Mississippi had 37,928 registered births in 2016. Fertility rates are defined as a number of births per 1,000 women (Martin et al., 2018). The 2016 United States national fertility rate was 62, and the state average in Mississippi was 63.7 (Martin et al., 2018). With Mississippi having a higher than average fertility rate, effectively treating labor-associated pain should be a priority. Epidural analgesia is considered to be the most effective method of analgesia for obstetric patients experiencing pain from maternal labor (Vyver, Halpern, & Joseph, 2002). This method of analgesia is useful for labor and vaginal delivery and can also be utilized in the event of an emergent cesarean section when the patient already has an existing epidural catheter (Braveman et al., 2013). Epidural analgesia is typically administered as a continuous infusion or as epidural PCA (Braveman et al., 2013).

A meta-analysis comparing the use of continuous epidural infusions to epidural PCA for laboring analgesia found that epidural PCA results in less required anesthetic interventions decreased amounts of administered local anesthetics, and a less dense motor blockade (Vyver et al., 2002). Epidural PCA has not consistently been found to be superior in satisfaction scores to continuous epidural infusions (Halpern & Carvalho,

2009). However, epidural PCA does afford the laboring patient greater control over her analgesia experience (Halpern & Carvalho, 2009). Speculation exists that satisfaction scores comparing continuous epidural infusions to epidural PCA may not be accurately measured (Halpern & Carvalho, 2009).

Low concentrations of long-acting amide local anesthetics such as ropivacaine or bupivacaine are typically used for epidural labor analgesia (Braveman et al., 2013). The addition of an opioid such as fentanyl or sufentanil may also be used in conjunction with a local anesthetic to achieve a lower concentration and higher volume (Braveman et al., 2013). Dosing protocols for epidural PCA vary widely among institutions (Braveman et al., 2013).

Barriers to Epidural PCA Use

Several barriers to epidural PCA use exist in obstetric patients. The use of an epidural has been shown to prolong the laboring process (Grant, Tao, Craig, McIntire, & Leveno, 2015). While differences in the length of time during the first stage of labor are insignificant, the second stage of labor is lengthened by a short amount of time when an epidural medication is administered (Grant et al., 2015). The need for instrumentation during delivery is also increased in patients who receive an epidural or a combined spinal-epidural (Grant et al., 2015). The most probable explanation for this association is an inhibition of maternal expulsive efforts or interference with the rotation of the fetal head (Grant et al., 2015). These factors may result in obstetric patients desiring to avoid epidural PCA.

Patient-specific anatomic factors may lead to increased difficulty of epidural placement (Braveman et al., 2013). Obesity correlates with an increased difficulty in

provider identification of anatomical landmarks (Macres et al., 2013). Neuraxial anesthesia with local anesthetics will often lead to hypotension with subsequent nausea (Macres et al., 2013). This is typically more pronounced in spinal anesthesia than epidural anesthesia.

Many patients experience misconceptions in relation to laboring epidurals. Some patients fear that the use of an epidural will increase the chance of an unscheduled cesarean section (Grant et al., 2015). No evidence exists to suggest that the use of epidurals for labor analgesia results in an increased chance of required cesarean delivery (Grant et al., 2015). Combined spinal-epidural techniques also do not increase the risk of cesarean delivery (Grant et al., 2015). However, the existence of these misconceptions and a lack of patient information may deter patients from requesting an epidural.

By definition, epidural PCA is patient controlled. One of the defining attributes of patient-controlled analgesia is that the patient determines the appropriate dose for sedation and analgesia (Cohen, 2009). This safety feature is overridden when someone besides the patient pushes the dose demand button, an event known as 'PCA by proxy' (Cohen, 2009). PCA by proxy often occurs when a family member or friend is trying to assist the patient and presses the PCA dose demand button (Cohen, 2009). PCA by proxy results in over sedation of the patient and is no longer considered patient-controlled analgesia (Cohen, 2009).

Advantages to Epidural PCA Use

Epidural analgesia is a commonly used method of pain control for obstetric patients that provides excellent analgesia for labor (Braveman et al., 2013). Several advantages occur with the use of epidural PCA. Patient-controlled analgesia is more effective in providing adequate pain relief than intermittent intramuscular or intravenous injections (Patak et al., 2013). Patients who utilize PCA have an increased perception of control over their pain control experience (Patak et al., 2013). Patients who receive epidural PCA do not have to wait for a nurse to bring them a dose and they also avoid injections (Patak et al., 2013). The advantage of not having to request a nurse's assistance is multifactorial. Not only does a patient not have to request a nurse's assistance, but the nurse has more time to devote to other tasks. Decreasing the workload of the nursing staff is advantageous because nurses are often extremely busy.

Currently, there is not enough evidence to support the statement that PCA absolutely improves patient satisfaction more so than other methods of pain control (McNicol, Ferguson, & Hudcova, 2015). An insufficient amount of evidence also exists to determine the difference in pain intensity when epidural PCA is utilized (McNicol et al., 2015). However, it is clear that patients typically express a preference for PCA as their method of pain control, most likely due to increased autonomy and situational control (McNicol et al., 2015). The possibility exists that epidural PCA can increase patient satisfaction simply by adhering to patient preferences. After all, patients are customers in the healthcare industry and customers have preferences for the product that they choose.

Patient Satisfaction

The concept of patient satisfaction can be divided into two separate terms, 'satisfaction' and 'patient' (Batbaatar, Dorjdagva, Luvsannyam, & Amenta, 2015). Outside of the context of health care, the term 'satisfaction' refers to the fulfillment of desires, meeting expectations, or the derivation of pleasure (Batbaatar et al., 2015). When applied to the context of a healthcare setting, satisfaction refers to a congruency between patient needs, expectations, desires, and provided services (Batbaatar et al., 2015). Stated another way, patient satisfaction is a combination of the service a patient expects or needs and the service that is actually received. Patient needs, expectations, and desires are all defining attributes of the concept of patient satisfaction.

The terms patient, consumer, and customer are often used interchangeably in the healthcare industry (Batbaatar et al., 2015). Thus, the terms 'patient satisfaction', 'consumer satisfaction', and 'customer satisfaction' may also be substituted for one another when used in the context of health care. Though they are used interchangeably, the terms 'patient', 'consumer', and 'customer' each has its' own definition (Batbaatar et al., 2015). A consumer is a person who purchases a product or service with the intention of personal use (Batbaatar et al., 2015). A customer is defined as one who buys goods or services from a business or as a certain type of person that one must have dealings with (Batbaatar et al., 2015). The term 'patient' can have several different meanings depending on the intentional use of the word. As an adjective, being patient refers to the ability to withstand delays or waiting periods without becoming upset (Batbaatar et al., 2015). When used as a noun, a patient is one who is receiving or is registered to receive medical treatment (Batbaatar et al., 2015). In the context of patient satisfaction, the latter

definition of the word is utilized. Therefore, medical treatment is also a defining attribute of the concept of patient satisfaction.

Measuring Patient Satisfaction

Patient satisfaction is a subjective state of mind that varies from patient to patient. However, the measurement of patient satisfaction has proven to be quintessential to quality improvement in healthcare organizations (Al-Abri & Al-Balushi, 2014). With such an important impact on quality decisions made by healthcare organizations, the evaluation of patient satisfaction may be a reflection of the partnership that patients share with these organizations to improve quality (Al-Abri & Al-Balushi, 2014).

The measurement of patient satisfaction may be either qualitative or quantitative (Al-Abri & Al-Balushi, 2014). Of these two methods, quantitative measurement allows for more accurate recordings of patient satisfaction trends that may be repeated as needed (Al-Abri & Al-Balushi, 2014). Numeric pain scales are often utilized in hospitals to assess a patient's current pain status but offer limited usefulness in assessing overall patient satisfaction with pain control. In order to measure patient satisfaction, a measurement tool is necessary. Several instruments are available for the measurement of patient satisfaction. Standard questionnaires are the most commonly utilized tools to conduct studies assessing patient satisfaction (Al-Abri & Al-Balushi, 2014). Questionnaires can be administered over the phone but are typically administered as self-reported surveys (Al-Abri & Al-Balushi, 2014). The measurement tool chosen is quintessential to the success of the project because not all are created equal.

Surveys may be administered by private venders where the results are typically not published (Al-Abri & Al-Balushi, 2014). The results of these survey may not be

reliable or valid (Al-Abri & Al-Balushi, 2014). Many public standardized surveys are available that offer strong validity and reliability; however, they often only offer generalized questions that are not specific to the topic being assessed (Al-Abri & Al-Balushi, 2014). Finally, more specific instruments can be either created or modified from existing standardized instruments (Al-Abri & Al-Balushi, 2014). The survey administered in this project falls into the latter category.

Survey Selected in this Project

The survey selected to be utilized in this project was chosen due to its specificity to the topic being discussed. The survey in discussion consists of questions directed at assessing patient satisfaction with overall pain control as well as with features of the epidural PCA pump itself. Limited knowledge exists on the impact that PCA pump features have on patient satisfaction with their pain control (Patak et al., 2013). The survey includes both questions to be rated on a numerical scale as well as open-ended questions. The identification of these factors will offer healthcare organizations the ability to identify areas from improvement in this facet of patient satisfaction. Permission to utilize this survey or components thereof was obtained via email from Dr. Chad Brummett. The original survey was previously utilized in a prospective survey study at the University of Michigan by Dr. Brummett.

Specific Aims

The purpose of this project is to identify factors of epidural PCA that obstetric patients consider important regarding their satisfaction with their pain control experience. The use of epidural PCA is not exclusive to the obstetric population and many factors that impact patient satisfaction in the general population translate to the obstetric

population. While discussing the broad topic of patient satisfaction with pain control, there are several aspects that need to be considered. Patient satisfaction is important for a variety of reasons, one of which is that health care is a business. In the healthcare setting, patients are seen as customers, and patient satisfaction translates to customer satisfaction (Craig, Otani, & Hermann, 2015). A higher customer satisfaction increases the likelihood of a customer utilizing a healthcare organization's services again in the future, as well as recommending that organization's services to others (Craig et al., 2015). While difficult to measure, the possibility exists that hospitals may lose business to other organizations if pain control is inadequate. Many variables can influence a patient's perception of their pain control. Patient demographics such as age, gender, race, economic status, and overall health can all impact the way different patients are satisfied with their pain control experience (Craig et al., 2015).

Hospitals are no longer reimbursed simply for services rendered. Performance-based incentives now exist and hospital performance is evaluated by the Hospital Value-Based Purchasing (VBP) Program, which exists under the CMS (Elliot et al., 2016). In 2015, the Hospital VBP program distributed $1.4 billion dollars to hospitals in the form of performance-based incentives (Elliot et al., 2016). HCAHPS is a tool used by the Hospital VBP program to measure and record the patient experience of care (Elliot et al., 2016). Patient satisfaction with pain management is an integral component of the HCAHPS survey and as such offers hospitals an incentive to attempt to improve pain control strategies to improve patient satisfaction (Craig et al., 2015). A hospital's performance on the HCAHPS component of the Hospital VBP program accounts for 30% of a hospitals VBP Total Performance Score (Elliot et al., 2016). Patient satisfaction with

their pain control is one of the most important indicators of overall patient satisfaction. As such, patient satisfaction with their pain control can have a major impact on a patient's choice to return to a hospital or to recommend those services to another (Craig et al., 2015).

Summary

Patient satisfaction with pain control is an important component of overall patient satisfaction (Craig et al., 2015). Health care is largely quality based, and patient satisfaction is an important component of quality care. Epidural analgesia is the primary method for treating pain in the laboring patient (Braveman et al., 2013). Epidural PCA is a form of epidural analgesia that is often utilized in the obstetric population. Multiple factors can impact patient satisfaction with epidural PCA. Little knowledge currently exists about the impact that epidural PCA pump feedback features have on patient satisfaction (Patak et al., 2014). Examples of feedback features currently in use include lighted demand dose buttons and vibrating buttons (Patak et al., 2014). The primary purpose of this DNP project was to identify factors of epidural PCA that obstetric patients consider important in their pain control experience.

CHAPTER II - METHODS

Context

This prospective project was submitted to The University of Southern Mississippi's institutional review board (IRB) and approved for implementation at a medical center located in the State of Mississippi (Protocol #18060501). Project overview was then submitted and approved by the medical center's institutional review board for implementation. Contextual elements considered important to the introduction of this problem include factors such as patient population and the potential benefits of this research. The patient population involved in this project consists of obstetric patients utilizing epidural PCA for labor analgesia in a rural hospital in Mississippi. The Mississippi fertility rate is 63.7, which is higher than the national fertility rate of 62 (Martin et al., 2018). The intense pain of the labor process, in addition to Mississippi's higher than average fertility rates, reinforces the importance of optimal pain control in this patient population.

The choice of epidural PCA offers several advantages to obstetric populations as a method of labor analgesia. Epidural PCA increases a patient's sense of situational control as well as control over achieving pain relief (Patak et al., 2013). Patients utilizing epidural PCA have been shown to have decreased anxiety during the preoperative period and less postoperative depression (Patak et al., 2013). The choice of epidural PCA also allows patients to not have to request a nurse's assistance, thus avoiding a potential delay in the treatment of pain (Patak et al., 2013).

The identification of factors affecting patient satisfaction with epidural PCA has several potential benefits. As previously discussed, patient satisfaction with pain control

is an important indicator of overall patient satisfaction (Craig et al., 2015). Patient satisfaction with pain control is also an important component of the HCAHPS survey, and as such can impact a hospital's VBP Total Performance Score (Elliot et al., 2016). A hospital's VBP Total Performance Score determines the reimbursement a hospital will receive from Medicare's Hospital VBP program (Elliot et al., 2016). In addition to these financial implications, patient satisfaction with pain control is an important factor in the likelihood that a patient will either utilize a hospital's services again in the future or recommend those services to a friend (Craig et al., 2015).

Intervention

Description

The intervention in this project consists of the administration of a survey to obstetric patients to identify factors affecting patient satisfaction with epidural PCA. Upon discontinuation of epidural PCA and removal of the epidural catheter each patient was asked by their nurse if they would be interested in participating in the project by filling out a survey. Each survey was administered 24-48 hours after discontinuation of each patient's epidural catheter. Each patient was fully informed as to the purpose of the project. Patient participation in this project was entirely voluntary with each submission being anonymous and secure. Patients were informed that the care they received would not be altered in any way by their choice to fill out a survey. No incentive was offered to patients to complete a survey. The purpose of this project was to assess patient satisfaction in the obstetric population with epidural PCA. The intervention in this project did not alter patient care.

All completed surveys were placed in a locked box that was located in a secure office. This office is not accessible to the public. The locked box was only accessible by the chief CRNA. Data collection occurred over a time period of 3 weeks. At the conclusion of this 3-week period, the surveys were collected by the author for data analysis.

Participation Criteria

Several exclusion criteria apply to this DNP project. Patients under the age of 18 were excluded from this project. No surveys were administered to patients who were not mentally capable of making their own decisions. No inmates were included in this project. The age range of obstetric patients included in this project is 18 to 45 years of age. The patient population being studied is obstetric patients utilizing epidural PCA as a method of labor analgesia. Patients utilizing epidural PCA for reasons other than labor pain were not included. Patients undergoing a cesarean section were also excluded from this project.

Patients included in this project include patients utilizing epidural PCA for labor analgesia who are undergoing vaginal delivery. As discussed, each patient who participated in this project was mentally capable of giving consent for participation. The patient population in this project consists of women ages 18 to 45 years of age in the State of Mississippi. Other demographics studied include each patient's age, race, and parity.

Team Specifics

Multiple team members were involved in this project. Team members include the author, each patient's nurse, and the chief certified registered nurse anesthetist (CRNA).

The author was responsible for the organization of this project, the review of the literature, and the analysis of data. The obstetric registered nurse (RN) was responsible for administering and collecting the survey. The obstetric RN then placed the survey in the secure survey collection box. The surveys were kept in a secure location by the chief CRNA. At the conclusion of the data collection period, the surveys were transferred into the possession of the author.

Additionally, this DNP project is chaired by Dr. Nina McLain, Ph.D., CRNA. The project committee members include Dr. Michong Rayborn, DNP, CRNA, as well as Dr. Bonnie Harbaugh, Ph.D., RN. Dr. McLain provided direction and guidance to the author in the organization and completion of this DNP project. Additional input and assistance were provided by the DNP committee.

Analysis

The survey tool administered in this project included six questions. The first question assessed each patient's satisfaction with their ability to control their pain on a numerical scale of 0 to 10 with 0 being not at all satisfied and 10 being very satisfied. The next question was a select yes or no question that asked each patient if they were able to adequately control their pain using the epidural pain pump. Question three requested that each patient rate on a scale of 0 to 10 how satisfied they are with their overall experience using the epidural pain pump. Question four assessed epidural PCA ease of use and asked each patient to rate the ease of use on a 0 to 10 numerical scale, with 0 being not easy at all and 10 being extremely easy. The following portion of the survey assessed whether patients felt that a lighted demand button would be easier to use. There was a select yes or no portion to this question followed by an area for open-ended

comments. The final question is a yes or no question that assessed if patients were aware if a dose was available when requested.

This project aimed to analyze patient satisfaction measures obtained from administrated questionnaires. The analysis included percentages of patient satisfaction measures as well as descriptive statistics. The descriptive statistics used to analyze the data in this project included averages, with outliers to the mean also being addressed.

Upon the completion of data collection and analysis, an executive summary of this project was completed. This executive summary was sent to a panel of experts including the chief CRNA, the chief anesthesiologist, and the obstetric nurse manager. The executive summary included a summarized report pertaining to the purpose of this project. Results from the analyzed data were included. The author of this project hopes that the results of this project will allow for improvements in the pain management process of obstetric patients utilizing epidural PCA. In order for improvements to be made, the assessment of patient perception with epidural PCA is crucial.

Ethical Considerations

The discussion of ethical considerations is necessary in the context of this DNP project. No patient identifiable information was collected in the administered survey. This project did not include the collection of any data from inmates. No patients under the age of 18 were included in this project. The completion of this survey was entirely voluntary and no incentives were offered for project participation. Patients were fully informed as to the purpose of this project. This project was conducted for the pursuit of knowledge and in accordance with the ethical requirements of The University of Southern Mississippi's School of Leadership and Advanced Nursing Practice.

All completed surveys were stored together in a locked box located in a secure office. This area is not accessible to the public. Each survey was placed in this box immediately upon completion by the patient's nurse. Patients were instructed not to place any patient identifiable information on the survey.

Doctor of Nursing Practice Essentials

The Doctor of Nursing Practice (DNP) Essentials form the foundation for advanced nursing practice roles (American Association of Colleges of Nursing [AACN], 2006). There are eight DNP Essentials that encompass the DNP role. The applicability of each essential will vary depending on the role in which a student is preparing to pursue (AACN, 2006). The competencies most applicable to this DNP project are DNP Essentials III, IV, and V.

DNP Essential III

The third DNP Essential is clinical scholarship and analytical methods for evidence-based practice (AACN, 2006). DNP Essential III involves the use of existing knowledge to solve an issue or to make an improvement (AACN, 2006). The scholarship of application is also referred to as the scholarship of the practice of nursing (AACN, 2006). This DNP essential serves to bridge the gap between the generation of new knowledge and its integration into practice (AACN, 2006). This project includes the administration of a survey assessing the impact of factors on patient satisfaction with epidural PCA. An evidence review pertaining to patient satisfaction has been conducted and applied to this DNP project. This DNP project seeks to review current evidence, analyze data, and apply results for the improvement of pain control in obstetric patients utilizing epidural PCA as a method of analgesia.

DNP Essential IV

DNP Essential IV is information systems technology and patient care technology for the improvement and transformation of health care (AACN, 2006). The fourth DNP Essential involves the use of information technology to make improvements in patient care and the healthcare setting (AACN, 2006). Information systems technology is an integral component of improving quality and is applicable to this DNP project. By identifying factors of epidural PCA pumps that affect patient satisfaction, improvements can be made to increase satisfaction levels. With this increase in quality, an increase in patient satisfaction can follow. Increasing quality is critical to improving patient satisfaction. Health care is largely quality driven, and improvements in quality are critical for the success of organizations as well as patient satisfaction with pain control.

DNP Essential V

The fifth DNP Essential is healthcare policy for advocacy in health care (AACN, 2006). This essential is applicable when discussing the issue of patient satisfaction. Healthcare policies can exist as governmental, institutional, or organizational standards (AACN, 2006). These policies can serve to either impede or facilitate the delivery of quality healthcare services (AACN, 2006). Healthcare policies can impact multiple healthcare issues, including quality of care (AACN, 2006). DNP graduates are in a unique position to influence these healthcare policies. With the purpose of this DNP project seeking to identify factors affecting obstetric patient satisfaction with epidural PCA, it is possible to create or modify standards by which epidural PCA is administered as a method of analgesia.

Summary

Contextual elements that were important in this project include the patient population being studied and the potential benefits of the research. The patient population upon which this project is centered consists of obstetric patients utilizing epidural PCA for labor analgesia in a small rural hospital setting in the State of Mississippi. Benefits of this project include the identification of factors that affect obstetric patient satisfaction with epidural PCA. Patient satisfaction is important for both hospital reimbursement and future revenue. Patients who are satisfied with their pain control are more likely to utilize a healthcare organization's services in the future (Craig et al., 2015).

The intervention in this project consisted of the administration of a questionnaire to obstetric patients with the intent of identifying factors affecting patient satisfaction with epidural PCA. Analysis of the questionnaires included descriptive statistics as well as percentages of patient satisfaction measurements. Patient care was not affected by the patients' choice to participate in this project. Only patients aged 18 years of age or older were included in this project. No inmates were included. Patient participation was entirely voluntary and anonymous.

CHAPTER III - RESULTS

Results

A total of 14 questionnaires were received during the 3-week data collection period. Each participant who chose to complete a survey was at least 18 years of age and met all of the required participation criteria. Each participant included in the project voluntarily consented to participate by signing a consent form and completing a questionnaire.

Each questionnaire consisted of six questions. Several demographics were also included in the questionnaire. The patient demographics included in the questionnaire are patient race, age, and number of children. Of the 14 answered questionnaires, 13 were fully completed. One participant chose to partially complete a survey.

Demographics

Of the 14 participants in this project, 57% (8) were Caucasian, 29% (4) were African American, 7% (1) was Asian, and 7% (1) chose not to respond. The participant ages ranged from 18 to 34 years of age with a mean participant age of 24 years. The participant parity ranges from 1 to 4 with a mean parity of 1.6.

Responses

The first question in the questionnaire assesses each patient's satisfaction with their ability to control their pain. A 0 to 10 numerical scale was utilized with 0 being not at all satisfied and 10 being extremely satisfied. For Question 1, patients reported a mean satisfaction of 9.2 with 5 being the lowest response and 10 the highest.

The second question asks patients if they felt they were adequately able to control their pain using their PCA pump. This question was a yes or no response. Thirteen

patients selected yes and one patient did not answer this question. None of the participants selected no to this question.

The third question asks patients how satisfied they were with their overall experience using the PCA pump. A 0 to 10 numerical scale was utilized for this question with 0 being not at all satisfied and 10 being extremely satisfied. A mean satisfaction of 8.6 was reported with 0 being the lowest response and 10 being the highest.

The fourth question assesses how easy each patient feels their PCA pump was to use. A 0 to 10 numerical scale was utilized in this question with 0 being not at all easy and 10 being extremely easy. A mean response of 9.2 was reported with 7 being the lowest response and 10 being the highest.

The fifth question asks patients if they knew a pain dose would be available from their PCA pump when they pressed their demand button. A yes or no response was utilized in this question. Eleven patients reported that they did know when a dose was available. The remaining three patients reported that they did not know when a dose was available.

The final question asks patients if they felt their PCA pump would have been easier to use if their PCA button or cable had a lighted demand dose button. A yes or no response was utilized in this question. A free response section was also attached to this question for any open-ended responses patients wished to make. Of the 14 participants, 5 responded that they felt a lighted PCA button would have made the pump easier to use. The remaining 9 responded that they did not feel the light would increase ease of use.

In the final question, six patients left a comment in the open-response section of the question. Among the responses, three patients responded that they were satisfied with

the PCA pump the way that it was and did not feel a light would enhance their pain control experience. One patient stated that she felt a light on the PCA demand button would make the demand button easier to find when experiencing high levels of pain. One patient stated that a lighted demand button would help to locate the demand button in the dark. The final patient stated that she was not aware that she could press her demand button.

Contextual Elements

Several contextual elements that interact with the intervention are important to note. First and foremost is that each patient's pain control experience is a unique event. A variety of factors impact a person's pain control experience and no two experiences are identical. Patients utilize their PCA pump at different times during the day and night. Different participants may experience differing degrees of pain during the laboring process. Another important element to note is that each patient experiences their own unique interactions with healthcare providers and various hospital staff.

Unintended Consequences

Several benefits and unintended consequences may be noted from the results of this project. Patients in this project were very satisfied overall with both their PCA pump and their ability to manage their pain. However, 35.7% (5) of patients still reported that they felt a lighted demand button would make their demand button easier to find. One patient also reported that she was not aware that she could use her PCA demand button. This response may indicate a communication issue between the patient and their healthcare team. The low survey response rate is an issue that was not expected in this project.

Summary

Fourteen surveys were collected during the 3-week data collection period. Overall, patients were highly satisfied with their ability to control their pain and felt their PCA pump was easy to use. Patients also reported that they felt the PCA pump was easy to use and were satisfied with their overall experience using the epidural PCA pump. Three patients reported that they did not know when a dose would be available. Five patients reported they felt that a lighted demand dose button would make the epidural PCA pump easier to use.

CHAPTER IV – DISCUSSION

Discussion

In this project, participant responses indicate that patients were satisfied with their ability to control their pain. Participants also reported satisfaction with the use of their PCA pump and felt that it is easy to use. However, 35.7% of patients responded that they felt a lighted demand button would make the PCA pump easier to use. While the sample size is small, the possibility exists that this feature can improve a laboring patient's pain control experience. A lighted demand button may be especially important for patients who are attempting to locate their demand button in low light situations. Future studies may benefit by analyzing patient satisfaction levels of patients who utilize an epidural PCA pump during low light situations and comparing results to those who utilize an epidural PCA pump during the day.

Three of the 14 patients reported that they were unaware if a dose of medication would be available when they press their demand button. A specific aim of this DNP project is the identification of factors that obstetric patients feel is important in their pain control experience. The pumps utilized in this project do not have a feedback mechanism that alerts the patient of an available dose. A lack of patient feedback is typical of most pumps, as the majority of PCA pumps currently in use do not offer feedback mechanisms to alert patients of an available dose (Patak et al., 2013). Without a feedback system to alert patients of an available dose, it is possible that the pain control experience of laboring patients is not being fully optimized. Examples of feedback mechanisms that are currently available for epidural PCA pumps include lighted demand buttons, lighted cables, and a demand button that vibrates when a dose is available (Patak et al., 2013).

One of the strengths of this DNP project is the questionnaire utilized assessed patient satisfaction with the epidural pain pump from multiple angles. The questionnaire assessed overall satisfaction with the pain pump as well as the ease of use. In addition to these questions, the questionnaire also asked patients if they were aware when a dose was available and if they felt a lighted demand button would increase the ease of use of their pump. This combination of generalized and specific questions offers insight towards patient perceptions of the pump.

The second strength of this DNP project is the content that is being studied. Little evidence currently exists in the literature concerning how PCA pump features affect patient satisfaction with their pain control experience (Patak et al., 2013). While a plethora of studies have been conducted that compare various medication regimes to one another, much is from the 1990s and is not current literature.

Interpretation

A primary goal of this project is to identify factors of epidural PCA that obstetric patients consider important regarding their satisfaction with their pain control experience. Patient satisfaction with pain control is an important component of overall patient satisfaction (Craig et al., 2015). Health care as an industry is largely quality based, and patient satisfaction is an important aspect of quality care. Patient satisfaction is an integral component of HCAHPS, which is utilized by CMS to analyze patient care experiences (Elliot et al., 2016).

The results of the distributed questionnaires suggested that the obstetric patients involved in this project were satisfied with their pain control experiences. Patients reported that they were satisfied with their ability to control their pain, felt the pump was

easy to use and were satisfied with their overall experience using the pump. However, 21.4% of patients reported not knowing if their pain pump was ready to deliver pain medicine upon demand. Also, 35.7% of patient responses indicate that they felt a lighted demand button would have made their pain pump easier to use. Neither of these issues appears to have had a significant impact on patient satisfaction with their pain control experience.

Comparison of Findings

As previously discussed, there is currently limited evidence regarding patient satisfaction with PCA pump features. However, one prospective study in Michigan administered questionnaires to patients utilizing PCA pumps. The purpose of this particular study was to identify features of the PCA pumps that patients considered important to their satisfaction with the pump (Patak et al., 2013). The study was not specific to obstetric patients or epidural PCA. However, several of the same questions were utilized in the administered questionnaires as this DNP project.

The prospective study in discussion analyzed 350 questionnaire responses regarding patient satisfaction with their PCA pump (Patak et al., 2013). Of the respondents, 14% reported that they were unaware when a dose was ready to be delivered upon demand (Patak et al., 2013). In the same study, 57% of respondents felt that a lighted demand button would make their PCA pump easier to use, as opposed to 35.7% of patients in this DNP project (Patak et al., 2013).

Limitations

Due to the low number of participants in this project, the author is not confident that the results of the analyzed questionnaires can be applied to a broader population.

Time constraints restricted data collection to a time period of three weeks, and 14 total responses were collected. Also, patient satisfaction is a subjective state of thought. The questionnaires utilized in this project attempt to quantitatively analyze patient responses regarding patient satisfaction. A patient who responds to a question with a certain satisfaction level may not be representative of another patient's response to the same situation. Therefore, a larger number of responses is necessary for an accurate analysis.

Several efforts were made to minimize bias in this project. No incentive was offered to patients to participate in this project and all responses were random. The author remained unaware of which patients participated in this project. Patient responses had no identifiable information. The completion of this project was a necessary component of a terminal degree for the author. As such, an incentive did exist for the author to complete this DNP project.

Conclusions

Patient satisfaction is a quintessential aspect of quality health care. Many healthcare organizations are intent on improving the quality of the services they provide. Pain is a source of anxiety and fear for many patients. Inadequate pain control can lead to prolonged hospital stays, increased readmission rates, higher costs of care, and decreased patient satisfaction (Patak et al., 2013). As such, patient satisfaction with pain control is an important indicator of overall patient satisfaction and is a major theme of quality-based care (Craig et al., 2015).

Adequate labor analgesia is imperative for patient satisfaction in the obstetric population. Inadequate pain control for obstetric patients has many deleterious consequences. The use of epidural analgesia is currently a frontline treatment for pain

control in the laboring patient (Braveman et al., 2013). Analgesia for the laboring patient is often accomplished with the use of an epidural PCA pump. The identification of factors that affect patient satisfaction with epidural PCA may result in further improvements in pain control experiences for laboring patients.

This DNP project focused on obstetric patients utilizing epidural PCA for labor analgesia. However, the use of PCA is not confined to either obstetric patients or the use of an epidural. Factors that impact patient satisfaction with epidural PCA may translate to other variations of PCA use. Therefore, the identification of factors that obstetric patients consider important concerning epidural PCA may help improve other forms of PCA in the future. Hopefully, future studies will continue to attempt to identify factors that patients consider important with their epidural PCA experience.

Summary

Patients involved in this project were satisfied with their ability to control their pain and their PCA pump. However, 3 of 14 patients reported not knowing if a dose was available, and 5 of 14 patients felt that a lighted demand dose button would make the epidural PCA pump easier to use. While the sample size is small, the possibility exists that feedback features such as a lighted demand dose button may improve pain control experiences for patients utilizing epidural PCA. Due to the low sample size, the results of this DNP project cannot be generalized to the entire obstetric patient population. An important limitation of this project is the large number of factors that affect patient satisfaction with their pain control.

APPENDIX A – Letter of Support from Facility

Dear Dr McLain,

We are happy to work with James McRae on his OB epidural pump doctoral project as one of our quality improvement initiatives. I will be working with our OB nurses to collect the surveys and secure them. Once we have confirmation that the USM IRB has approved this project, I will discuss this project with the Anderson Regional Medical Center risk management team. We look forward to this opportunity.

Thank you,

Jason Coleman CRNA, DHA
Chief Nurse Anesthetist
Meridian, MS

APPENDIX B Survey Tool

Survey #

Pain Pump Patient Satisfaction Survey

Race: Gender: Age: Number of Children:

1. How satisfied were you with your ability to control your pain?

0	1	2	3	4	5	6	7	8	9	10
Not at All Satisfied										Extremely Satisfied

2. Do you feel you were able to adequately control your pain using the epidural PCA pump? Yes / No

3. How satisfied were you with your overall experience using the epidural PCA pump?

0	1	2	3	4	5	6	7	8	9	10
Not at All Satisfied										Extremely Satisfied

4. How easy was your overall experience using the epidural PCA pump?

0	1	2	3	4	5	6	7	8	9	10
Not at All Easy										Extremely Easy

5. Did you know when the epidural PCA pump was ready to deliver pain medicine so that when you pushed your pain button you received pain medicine? Yes / No

6. Do you feel it would have been easier for you to use your pump if the button had a light that made it easier to see or to find? Yes / No
   Please explain.
   _____
   _____

APPENDIX C – IRB Approval Letter

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 18060501
PROJECT TITLE: Following Epidural PCA Use, Do Obstetic Patients Feel Satisfied with The Pain Control Experience
PROJECT TYPE: New Project
RESEARCHER(S): James McRae
COLLEGE/DIVISION: College of Nursing
DEPARTMENT: School of Leadership and Advanced Nursing Practice
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 07/02/2018 to 07/01/2019
Edward L. Goshorn, Ph.D.
Institutional Review Board

APPENDIX D Executive Summary

EXECUTIVE SUMMARY: FOLLOWING EPIDURAL PCA USE, DO OBSTETRIC PATIENTS FEEL SATISFIED WITH THEIR PAIN CONTROL

James McRae

The University of Southern Mississippi

EXECUTIVE SUMMARY

Background

Introduction

The healthcare industry of today is largely based on quality. As such, patient satisfaction has become a key focus of healthcare organizations. Pain is a source of anxiety and fear for many patients and may result in deleterious patient outcomes (Patak et al., 2013). Patient satisfaction with pain control is an important indicator of overall patient satisfaction (Craig, Otani, & Hermann, 2015). There are many methods of pain control used to treat numerous patient populations. The utilized method and patient population discussed in this executive summary is epidural patient-controlled analgesia (PCA) use in obstetric patients experiencing pain from labor.

Problem overview

Pain during labor is a particular concern of obstetric patients. Epidural analgesia is currently the frontline treatment for managing pain related to labor (Braveman, Scavone, Blessing, & Wong, 2013). Epidural PCA is often used and can increase a patient's perception of control over their pain (Halpern & Carvalho, 2009). While an abundance of knowledge exists concerning patient satisfaction with epidural PCA, much of this relates to one pharmaceutical regime versus another (Patak et al., 2013). Little evidence currently exists concerning patient satisfaction as it relates epidural PCA pumps (Patak et al., 2013). This study assessed patient satisfaction as it relates to each patient's experience with their epidural PCA pump. The study consists of a questionnaire that was administered to obstetric patients utilizing epidural PCA for labor analgesia.

Methods

A questionnaire consisting of 6 questions was administered to obstetric patients utilizing epidural PCA. Each participant in this study volunteered and met the requirements to participate in this study. Data collection occurred over a time period of 3 weeks, during which time 14 questionnaires were collected. Participation in this study was entirely voluntary and no incentives were offered to participants. Written consent was obtained from each patient prior to completing a questionnaire.

Requirements for Participation

Only patients 18 years of age or older were included in this study. Each patient that participated was mentally capable of making independent decisions. No inmates were included in this study. Only patients utilizing epidural PCA for labor analgesia were included. Patients scheduled for a cesarean section were excluded from the study.

Intervention Description

Prior to obtaining consent, each patient was fully informed as to the purpose of this study. Each participant received a questionnaire within 48 hours post-delivery. The questionnaires were collected prior to patient discharge and kept in a secure location. Data collection occurred over a time period of three weeks. 14 questionnaires were completed.

Results

Questionnaire Responses

Each questionnaire consisted of 6 questions. Question 1 asked each participant how satisfied they were with their ability to control their pain, with 0 being not at all satisfied and 10 extremely satisfied. The mean response to question 1 was 9.2. Question 2 asked each participant if they felt they were adequately able to control their pain using their epidural PCA pump.

92.8% of participants responded yes to question 2. The third question utilized a numerical scale that asked participants how satisfied they were with their overall experience using the epidural PCA pump. The mean response to question 3 was 8.6. Question 4 utilized a numerical scale and asked each participant how easy they felt their epidural PCA pump was to use. The mean response to this question was 9.6. Question 5 asked each participant if they were aware if a dose was available when they pressed their demand button. 21.5% of participants responded that they were not aware if a dose was available. Question 6 asked each participant if they felt that a lighted demand dose button would make the epidural PCA pump easier to use. 35.7% of participants selected yes to this question.

Discussion

Limitations

Several limitations in this study merit discussion. The results of this study are limited by the low number of participants. Data collection was limited to a time period of 3 weeks, and likely needs to be much longer to ensure a larger number of participants. With only 14 participants, the results of this study likely have a low chance of being repeated.

Recommendations

Due to the lower number of study participants, the author is not confident that the results of this study are representative of larger populations. However, there is a lack of evidence in the literature concerning the factors patients consider important regarding their experiences with PCA (Patak et al., 2013). While the generalizability is low, 35.7% of patient did respond that they felt a feedback feature such as a lighted demand dose button would make their epidural PCA pump easier to use. Future studies concerning PCA pump feedback features may have a positive impact on patient satisfaction.

References

Braveman, F. R., Scavone, B. M., Blessing, M. E., & Wong, C. A. (2013). Obstetrical anesthesia. In P. G. Barash, B. F. Cullen, R. K. Stoelting, M. K. Cahalan, M. C. Stock, & R. Ortega (Eds.), *Clinical anesthesia* (7th ed., pp. 1144-1177). Philadelphia, PA: Lippincott Williams & Wilkins.

Craig, A. R., Otani, K., & Hermann, P. A. (2015). Evaluating the influence of perceived pain control on patient satisfaction in a hospital setting. *Hospital Topics*, *93*(1), 108. https://doi.org/http://dx.doi.org.lynx.lib.usm.edu/10.1080/00185868.2015.1012926

Halpern, S. H., & Carvalho, B. (2009). Patient-controlled epidural analgesia for labor. *Anesthesia and Analgesia*, *108*(3), 921-928. https://doi.org/10.1213/ane.0b013e3181951a7f

Patak, L., Tait, A., Mirafzali, L., Morris, M., Dasgupta, S., & Brummett, C. (2013). Patient perspectives of patient-controlled analgesia (PCA) and methods for improving pain control and patient satisfaction. *Regional Anesthesia and Pain Medicine*, *38*(4), 326-333. https://doi.org/10.1097/AAP.0b013e318295fd50

REFERENCES

Al-Abri, R., & Al-Balushi, A. (2014). Patient satisfaction survey as a tool towards quality improvement. *Oman Medical Journal*, *29*. https://doi.org/ 10. 5001/omj.2014.02

American Association of Colleges of Nursing (AACN). (2006). *The Essentials of Doctoral Education for Advanced Nursing Practice*. Retrieved from file:///C:/Users/James/Desktop/Desktop%20Folders/ACTUAL%20DNP%20PROJECT/DNP%20articles/DNP%20essentials/DNPEssentials.pdf

Batbaatar, E., Dorjdagva, J., Luvsannyam, A., & Amenta, P. (2015). Conceptualization of patient satisfaction: A systematic narrative literature review. *Perspectives in Public Health*, *135*, 243-250. https://doi.org/ 10.1177/1757913915594196

Braveman, F. R., Scavone, B. M., Blessing, M. E., & Wong, C. A. (2013). Obstetrical Anesthesia. In P. G. Barash, B. F. Cullen, R. K. Stoelting, M. K. Cahalan, M. C. Stock, & R. Ortega (Eds.), *Clinical anesthesia* (7th ed., pp. 1144-1177). Philadelphia, PA: Lippincott Williams & Wilkins.

Cohen, M. R. (2009). *Patient-Controlled Analgesia: Making it Safer for Patients*. Retrieved from https://www.ismp.org/profdevelopment/PCAMonograph.pdf

Craig, A. R., Otani, K., & Hermann, P. A. (2015). Evaluating the influence of perceived pain control on patient satisfaction in a hospital setting. *Hospital Topics*, *93*(1), 108.https://doi.org/http://dx.doi.org.lynx.lib.usm.edu/10.1080/00185868.2015.1012926

Elliot, M. N., Beckett, M. K., Lehrman, W. G., Cleary, P., Cohea, C. W., Giordano, L. A., & Damberg, C. L. (2016). Understanding the role played by Medicare's

patient experience points system in hospital reimbursement. *Health Affairs*, *35*(9), 1673-1680. https://doi.org/http://dx.doi.org.lynx.lib.usm.edu/10.1377/.2015.0691

Foster, P. C., & Bennett, A. M. (2002). Self-care deficit nursing theory: Dorothea E. Orem. In J. B. George (Ed.), *Nursing Theories: The Base for Professional Nursing Practice* (5th ed., pp. 125-154). Upper Saddle River, NJ: Prentice Hall.

Grant, E., Tao, W., Craig, M., McIntire, D., & Leveno, K. (2015). Neuraxial analgesia effects on labour progression: Facts, fallacies, uncertainties and the future. *BJOG: An International Journal of Obstetrics and Gynaecology*, *122*(3), 288-293. https://doi.org/http://dx.doi.org.lynx.lib.usm.edu/10.1111/1471-0528.12966

Halpern, S. H., & Carvalho, B. (2009). Patient-controlled epidural analgesia for labor. *Anesthesia and Analgesia*, *108*(3), 921-928. https://doi.org/10.1213/ane.0b013e3181951a7f

Macres, S. M., Moore, P. G., & Fishman, S. M. (2013). Acute pain management. In P. G. Barash, B. F. Cullen, R. K. Stoelting, M. K. Cahalan, M. C. Stock, & R. Ortega (Eds.), *Clinical Anesthesia* (7th ed., pp. 1611-1644). Philadelphia, PA: Lippincott Williams & Wilkins.

Martin, J. A., Hamilton, B. E., Osterman, M. J., Driscoll, A. K., & Drake, P. (2018). Births: Final data for 2016. *National Vital Statistics Reports*, *67*(1), 1-55. Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr67/nvsr67_01.pdf

McNicol, E. D., Ferguson, M. C., & Hudcova, J. (2015). Patient-controlled opioid analgesia versus non-patient controlled opioid analgesia for postoperative pain. *Cochrane Database of Systematic Reviews*, *2015*(6), 1-126. https://doi.org/10.1002/14651858.CD003348.pub3

Patak, L., Tait, A., Mirafzali, L., Morris, M., Dasgupta, S., & Brummett, C. (2013). Patient perspectives of patient-controlled analgesia (PCA) and methods for improving pain control and patient satisfaction. *Regional Anesthesia and Pain Medicine*, *38*(4), 326-333. https://doi.org/10.1097/AAP.0b013e318295fd50

Vyver, M. V., Halpern, S., & Joseph, G. (2002). Patient-controlled epidural analgesia versus continuous infusion for labour analgesia: A meta-analysis. *British Journal of Anaesthesia*, *89*(3), 459-465. https://doi.org/ https://doi.org/10.1093/bja/89.3.459